

A COLLECTION OF LARGE CORE TOOLS FROM LOWLAND PAPUA, WESTERN PROVINCE, PAPUA NEW GUINEA

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Ten large core tools found at or near Gwaimasi village are described. The four waisted blades in the collection were generally somewhat shorter than the unwaisted tools, but no other attributes consistently distinguished these categories. Local people identified all these tools, irrespective of shape, as nut-opening hammers but this interpretation is doubtful.

□ Core tools, waisted blades, ethnoarchaeology, Papua New Guinea.

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In 1987 six large axe-like core tools, some waisted, were dug up at Gwaimasi (5°54'S, 142°6'E; 100m ASL), a Papua New Guinean village on the west bank of the Strickland River just south of the Blucher Range foothills. Another four of these implements were found within a few kilometres of the village (Fig. 1). Similar artefacts have previously been recovered in mainland Papua New Guinea from archaeological sites in the Highlands (Bulmer, 1964, 1977; White *et al.*, 1970), from lowlands just north of the central ranges (Gorecki, *pers. comm.*) and from Huon Peninsula on the north coast (Groube *et al.*, 1986). A few have been found as isolates elsewhere (Swadling, 1983), but none have previously been reported from lowland Papua.

This paper provides a description of the Gwaimasi blades. It discusses the context of the finds, their character, and possible interpretations.

CONTEXT

Gwaimasi is the Kubo name of a waterfall where a small stream drops down to join the Strickland River. In February 1986 a longhouse was built near the top of the fall, on an old levee bank. Over the next 18 months several smaller family houses were built nearby, to form the village that became known as Gwaimasi (or Komagato). The site had been gardened some 15-20 years earlier.

Six large blades made of flaked cobbles were found as ground was cleared within the village. Clearing entailed removal of all topsoil together with associated weeds, shrubs, tree trunks and roots. Soil throughout the 200m² area was turned

to a depth of 15-50 cm, and occasionally more. (This was not traditional practice but a response to government demands. It would not have occurred at this site before.) Stones larger than a few centimetres were tossed into heaps; some were to be used later as heat retainers in ovens. Four blades were discovered in these piles. The other two were recognized as they were dug up.

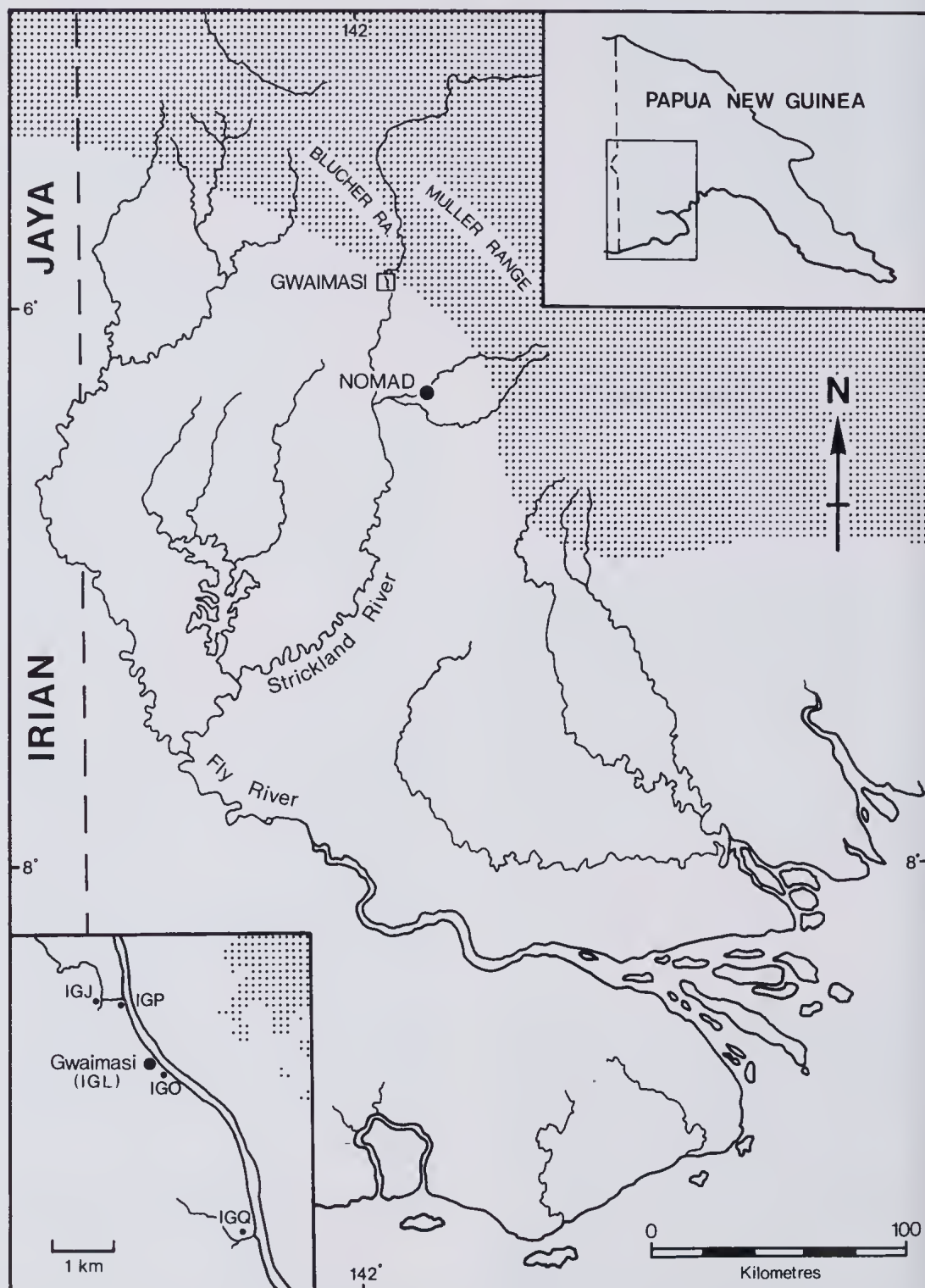
The top of the levee bank, where the village was built, was covered with several metres of coarse yellow-grey silt. Below this lay what appeared to be a cobble bed packed with clay, and then conglomerate rock. The blades were all found in the silt layer, which contained no obvious charcoal or bone that might be used to date the deposit. Apart from the blades themselves the only undoubted artifacts recovered from this layer were a few small chert flakes. No ground or polished artifacts were dug up, though these had been used at least in the recent past (some people still owned specimens).

Another four blades were found up to 4 km from Gwaimasi (Fig. 1). One was at a recently abandoned garden house (IGJ), where it had reportedly been used to open nuts. Another was on a table at an abandoned mining exploration camp (IGP). The third had been placed on a stump in a newly felled garden (IGO), while the last was brought back by a woman who found it while tending pandanus at an old garden site (IGQ).

All ten artefacts are registered in the Papua New Guinea National Museum.

DESCRIPTION OF BLADES

The Gwaimasi blades were all made from flat,



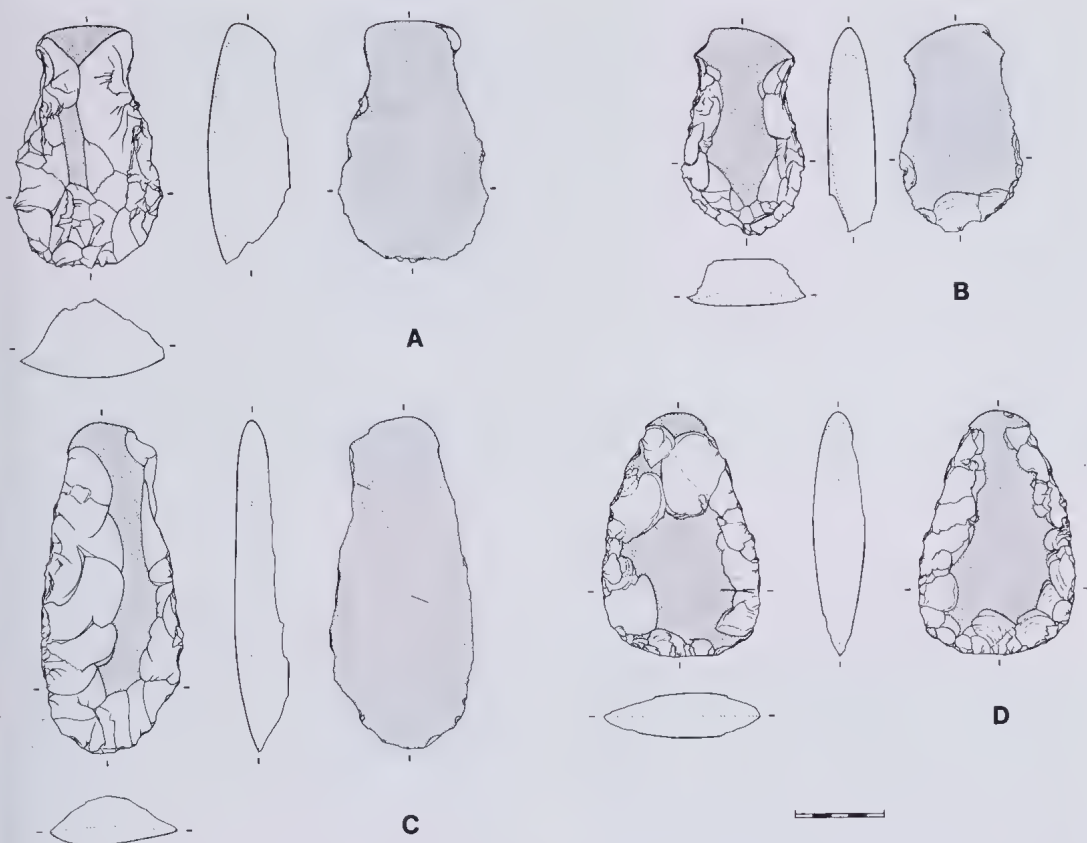


FIG. 2: Four examples of core tools from Gwaimasi. (A = 87.89.7.IGL.5; B = 87.89.4.IGL.2; C = 87.89.1.IGL.1; D = 87.89.3.IGL.1) Scale is in centimetres.

waterworn cobbles of indurated siltstone or mudstone; such cobbles would have been available as a minor component of conglomerate outcrops in the foothills just north of the village, and in streams draining those hills (Francis, 1989). They have been flaked along three sides, on one or both faces, but generally retain much of the original cortical surface. None shows any sign of grinding (Fig. 2; Table 1). Flaked surfaces on all but one of the blades have a well developed yellowish-brown weathering patina.

Eight of the blades were primarily unifacially flaked, with few flakes, if any, removed from the other face. All have a definite unflaked butt end and a convex edge at the distal end. They tend to have a plano-convex/subtriangular cross-section, with one face much more curved than the other, and an asymmetrical profile, with edges

crescent- or s-shaped when seen end on. Four of these eight blades are distinctly 'waisted', with a pronounced indentation flaked on each side near the butt end (Fig. 2a,b). Another three are roughly similar to these in shape but lack the obvious waist; they have, at most, some narrowing towards the butt (Fig. 2c). The last of the unifacially-flaked blades is somewhat different in shape; it is the narrowest in the collection, despite being the third longest. This blade (87.89.6.IGL.4) was the only one found with flaked surfaces unpatinated, suggesting that it was manufactured more recently than the others or, perhaps, less exposed to weathering.

Two blades were definitely bifacially flaked; they had flakes removed from both faces along all or most of three sides (Fig. 2d). Both fall within the range of sizes for the unifacially-

FIG. 1: Location of Gwaimasi and sites where core tools described were found. Shaded area is land above approximately 200 m.

TABLE 1: Dimensions of the Gwaimasi core tools.

PNG				
National Museum Catalogue No.	Length mm	Breadth mm	Thickness mm	Weight gm
Unifacially flaked waisted				
87.89.7.IGL.5	136.3	83.5	46.0	568
87.89.12.IGO.2	113.2	57.9	36.0	290
87.89.4.IGL.2	117.1	68.0	25.5	295
87.89.5.IGL.3	109.5	70.6	30.0	255
unwaisted				
87.89.1.IGJ.1	183	79.2	27.8	496
87.89.15.IGL.7	159	82.5	40.0	576
87.89.11.IGP.1	139.5	73.7	29.7	361
87.89.6.IGL.4	145.8	57.4	34.8	297
Bifacially flaked				
87.89.3.IGL.1	136.8	86.8	30.7	512
87.89.13.IGQ.1	120.8	73.0	30.0	367

flaked blades, and like those blades their butt ends are unflaked (though one may have been broken). They differ from the unifacially-flaked blades, however, in that their distal ends are less convex and they are lenticular in cross-section. One is very symmetrical in profile. The other, made of coarser stone and more roughly flaked, is less so. In both, edges are straight when seen end on. Neither of these blades is waisted.

Several of the blades have had small chips removed from the cortical face along edges. This chipping, possibly attributable to use damage, is concentrated at distal ends. Two blades have also had several large flakes removed from their cortical face at the distal ends (Fig. 2b). This may reflect attempts to rejuvenate worn blades; these are two of the three shortest blades in the collection.

Most attention in the literature on artifacts of this sort has focussed on waisted examples. Apart from the waisting itself, however, the only attribute that distinguishes waisted from unwaisted blades in this collection is length; the

four waisted blades are also four of the five shortest blades found (Table 1; P.05). No consistent differences appear in either breadth or thickness. Given that the two 'rejuvenated' blades mentioned above were both waisted, it may be that waisting somehow permitted continued use of blades that had been shortened beyond some critical point.

Detailed measurements for the four waisted blades from Gwaimasi (Table 2; dimensions concerned are indicated in Fig.3), compared with waisted blades from other sites in Papua New Guinea (Table 3), suggests some basic patterns. The Gwaimasi waisted blades are, on average, slightly shorter and 10–20mm narrower than those from two highland sites, Kosipe and Yuku, but fall well within the general range of variation. They are, however, 58mm shorter, and 63mm narrower on average than the rather older blades from Huon Peninsula; in fact, the Gwaimasi blades fall completely outside the range of breadths for the Huon blades. Relative to length and breadth the Gwaimasi blades are surprisingly thick. Average thickness is 11mm and 9mm greater than that of blades from Kosipe and Yuku respectively, and only 7mm less than that of the Huon blades. Finally, waists tended to be positioned nearer the butt on Gwaimasi blades than on those from the other sites. The actual positions fall within the range of those from Kosipe, but show only slight overlap with the range of positions on Huon and Yuku tools.

INTERPRETATION

The Gwaimasi blades appear to have been deliberately manufactured; they were not just cores that have been occasionally and opportunistically used for other tasks. Some of their morphological features, in particular the shapes of cross-sections and edges, may have been accidental consequences of the original shape of the cobbles and of whether flakes were removed from one or both faces. Other attributes, how-

PNG						
National Museum Catalogue No.	L	L ₂	L ₃	B	B ₂	B ₃
87.89.7.IGL.5	136	29	82	84	48	54
87.89.12.IGO.2	113	24	75	58	41	51
87.89.4.IGL.2	117	30	61	68	49	57
87.89.5.IGL.3	110	38	57	71	38	47

TABLE 2: Dimensions of four waisted blades from Gwaimasi (mm).

TABLE 3: Average dimensions of waisted blades from four New Guinea sites.

Site (n)	Length (mm)		Breadth(mm)		Thickness (mm)		Position of waist	
	\bar{L}	s (range)	\bar{B}	s (range)	\bar{T}	s (range)	\bar{L}_2/L	s (range)
Huon* (39)	177	24.9 (110–221)	130.3	19.4 (101–167)	41.5	9.4 (26–65)	0.42	0.05 (0.34–0.50)
Kosipe* (7)	126.6	32.1 (83–179)	93.6	30.6 (51–136)	23.1	9.6 (10–34)	0.33	0.11 (0.19–0.52)
Yuku* (10)	127	41.7 (74–215)	81.3	22.0 (57–128)	25.4	12.0 (15–48)	0.40	0.06 (0.32–0.49)
Gwaimasi (4)	119	11.9 (110–136)	70.0	10.5 (58–84)	34.4	8.9 (26–46)	0.26	0.07 (0.21–0.35)

* Data from Muke (1984).

ever, such as unflaked butt ends and the presence of waisting just below the butt, are more difficult to explain if the blades were simply a source of flakes. In addition, people living in the Gwaimasi area had ready access to much better stone in the form of chert cobbles from the same conglomerate outcrops that provided the stone for the blades; flakes of this chert were present

in the levee bank soils where most of the blades were found. But for what were these implements used?

The 25 people who lived at Gwaimasi in 1986–87 were Kubo speakers. This was the western extreme of Kubo land; virtually all other Kubo lived east of the Strickland. Use of stone tools was still part of Kubo life at this time. Chert flakes were used daily to work wood, bone and fibre. Carefully shaped chert cores formed the heads of sago pounders. Stone anvils and hammers were stored at the base of many nut trees, ready for use. Steel axes and bushknives were being used to fell trees and for coarse woodwork but several men, late teens and older, could recall ground stone axes being used for these purposes. (Nomad, the nearest government patrol post at 4 days walk away, was not established till the early 1960's, with regular patrols not reaching people in the Gwaimasi area till 1969.) Ground stone adzes had been used until even more recently for making canoes.

People at Gwaimasi identified the blades immediately as *hoi* (chopping implements). When pressed, they elaborated as *yu hoi* (stone axes) or *kogwai hoi* (ancestor's axes). After some months – a delay imposed not by reluctance to talk but by lack of a common language – several men gave more information. Though questioned separately their stories were remarkably similar. All the blades, irrespective of shape, were classed together as a particular kind of *hoi* – *hagagobi hoi* – used, they said, only for opening *haga* nuts (*Canarium* sp.). They were not hafted; the blade was simply held in the hand and swung

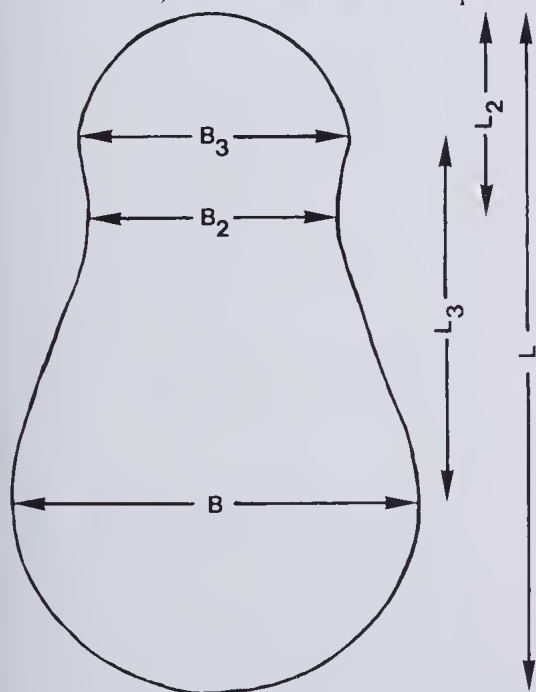


FIG. 3: Key to measurements of waisted blades.

as a hammer, with the side of the blade taking the impact. The men were adamant that the blades were not held as choppers, that the distal ends were not the utilized edges, and that the blades were not used for felling trees.

There are several reasons for doubting the above interpretation. First, most of the blades were simply too short to be used in the manner described without serious risk to knuckles. Stone hammers used by Gwaimasi residents to open nuts tended to be about 200mm in length. They were referred to as *dobae* and not *hoi*, were usually unmodified, had an oval cross-section and no obvious edge. Although one of the Gwaimasi blades (the longest in the collection; 87.89.1.IGJ.1) may well have been used in the previous twelve months to open *Canarium* nuts this observation is more likely to account for the proffered explanation rather than to substantiate it; the occurrence of patination on this blade implies that it had not been recently manufactured for the purpose. Secondly, the inner shell of *Canarium* nuts is very hard, and some use damage could be expected on hammers used to open them. Such damage was certainly evident on a hammer that was seen being used to open *kose* nuts (another *Canarium* sp.). The few signs of possible use damage seen on the collected blades tended to be concentrated at the distal edges, not the sides. Finally, when the first blade was found in the village one of the older men demonstrated to some youths how it would have been hafted - as an adze, not an axe. Later, the same man was one of the most adamant that such blades were not used with a haft.

It seems likely that the interpretation Gwaimasi people gave of these core tools was not based on knowledge of original manufacture and use. Rather, their account was based on the recent casual use some people had made of one blade. As such it deserves to be considered a possibility, but not accepted unquestioningly. Definitive functional interpretations will require analysis of wear and damage patterns on the blades themselves.

DISCUSSION

Large axe-like core tools, many of them waisted, have now been recovered from scattered sites in the highlands, lowlands and islands of Papua New Guinea. The few dated sites indicate that these implements were first used at least 40,000 BP (Huon; Groube *et al.*, 1986) and continued in use to at least 6,000 BP (Yuku; Bulmer,

1977). Flaked blades began to be finished by grinding during their final period of use at some sites, and their eventual disappearance from assemblages may be related to introduction of fine-quality polished axe-adzes from highland quarries (Bulmer, 1964, 1977).

Muke (1984) has argued that the size and weight of waisted blades has declined through time in Papua New Guinea. This would imply that the Gwaimasi blades are relatively young, and fit into the latter end of this sequence.

The addition of grinding techniques to the stoneworking repertoire was probably of major significance in Papua New Guinea. Bulmer (1977:58) suggested that edge-ground blades were more efficient than their flaked counterparts for many tasks. In particular, while flaked axes may have been adequate for small-scale clearing of trees (e.g. by ring-barking) associated with management of forest edge resources edge-ground blades may have been essential for substantial clearance of forests for gardens. If this interpretation is correct then at the time the Gwaimasi blades were being used the surrounding area may not have been being gardened; no ground implements were found in association with the flaked blades.

This does not necessarily mean that the people who used those blades were not gardeners. PNG farmers still regularly make special camps to exploit forest resources, such as pandanus nuts or sago, that are only available in areas above or below the altitude range of their gardens. Kosipe, a highlands site with a stone assemblage dominated by large flaked blades, has been interpreted as a seasonal camp for exploitation of pandanus nuts. Perhaps Gwaimasi, too, was a seasonal camp to which people, based in foothills and mountains to the north, descended to procure certain otherwise unobtainable forest resources. One such resource may have been sago, which grows wild in the extensive swamps behind Gwaimasi but does not naturally occur in the hills.

Given the limited amount of archaeological work done in interior lowland Papua New Guinea it is difficult to assess the merits of this suggestion. Interestingly, however, the only site in the northern lowlands where large numbers of flaked blades have been found (Yerem; Gorecki *pers. comm.*) occupies a situation almost identical to that of Gwaimasi - on the banks of a river just where it emerges from mountains to flow through sago swamps.

ACKNOWLEDGEMENTS

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